

REMARKS/ARGUMENTS

Favorable reconsideration of this application is requested in view of the amendments made above and the remarks that follow. A Request for Continued Examination is submitted herewith. No new matter has been introduced by this amendment.

The present invention is a paper or board that is fracture and crack-resistant but that retains other desirable mechanical properties. In the paper or board of the invention a thin film of polymer material is deposited in a discontinuous geometric pattern onto a pre-formed web of cellulose fibers to form a plurality of spaced apart crack-arresting islands that impede crack propagation and fracturing in the web. The polymer material penetrates into the web to define a substantially uniform flush surface for subsequent treatment such as coating and printing. Mechanical properties such as modulus of elasticity and tensile strength are unchanged in a paper or board treated in accordance with the invention.

The present invention is a product having structure and function not suggested in the references of record, whether the references are considered individually or in combination.

Claims 1-3, 6, 8, 18, 20-27, 29 and 31-43 stand rejected under 35 USC 112, second paragraph, on the grounds that it is unclear how the impregnated fiber network web can be uniform without the web being coated as in claim 8. In this regard, it is pointed out that the uniformity being claimed relates to the shape of the surface of the web and not to the consistency or composition of the web. That is, the polymer is applied as a thin film and penetrates into the web, leaving a substantially uniform or flush surface for subsequent treatment such as coating and printing, i.e. the coating referred to in claim 8. See, e.g. page 3, lines 10-14 of the specification as filed. The claims have been amended to clarify this point.

Claims 1-3, 6, 8, 18, 20-27, 29 and 31-43 also stand rejected under 35 USC 103(a) as unpatentable over Li et al (5,061,545) in view of Lindemann et al (3,404,112). In making this rejection it was the examiner's position that Li discloses a composite comprising a fibrous web impregnated with a polymeric composition in a regular or random pattern. The examiner acknowledged that Li does not disclose the web as comprising paper or board, but cited Lindemann as teaching a fibrous web that comprises paper or paperboard that can be calendered and printed. It is not apparent from the Office Action how it is intended to apply the teaching of Lindemann to the teaching of Li.

Li discloses a composite material for use in making bulletproof vests, helmets, armor plate and other military equipment in which high strength fibers such as aramid, graphite, ceramic, nylon and the like are embedded in a polymer matrix. The fibers used in the Li composite are not cellulose fibers as claimed in the present application and would not be suitable for making paper or paperboard. Moreover, the polymer matrix extends throughout the web of Li, whereas the polymer is applied only as a thin film on selected spaced areas of the web in the present invention. Further, the web in Li is passed between rollers that have raised areas which squeeze some of the polymer out of the web in selected areas, resulting in a web that has less polymer in some areas than in other areas, whereas only selected areas of the web in the present invention have any polymer. The web in Li also has less thickness in the squeezed areas, producing a non-uniform surface, whereas the surface of the web in the present invention is substantially uniform. Li is directed to a completely different invention than the paper or paperboard described and claimed in the present application.

Lindemann discloses a polymer coating composition for application to a cellulosic web to improve surface characteristics of the web, such as brightness, smoothness and gloss. The coating composition presumably is intended to be applied to the entire surface of the web.

The problems addressed and solutions offered by Li, Lindemann, and the applicant herein are completely different from one another. It is not apparent how the teaching of Lindemann can be applied to Li. Is it proposed to make the fibers in Li out of cellulose? To do so would completely destroy the invention described in Li. Even if this modification were made, the claimed invention would not result.

There is no suggestion in either Li or Lindemann of making a crack resistant paper or board wherein a thin film of polymer is deposited in a discontinuous geometric pattern onto a cellulosic fiber web to produce islands of polymer-impregnated fiber that impede fracturing and crack propagation in the web, and wherein the polymer penetrates into the web so that the surface of the web is substantially uniform, all as claimed herein.

To establish obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)

If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, or require a substantial reconstruction and redesign of the elements shown in the primary reference, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 122 USPQ 349 (CCPA 1959).

Appl. No. 09/522,359
Feb. 24, 2009
Reply to Office Action of November 26, 2008

TEC-043504-US

The examiner must determine what is “analogous prior art” for the purpose of analyzing the obviousness of the subject matter at issue. “In order to rely on a reference as a basis for rejection of an applicant’s invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.” *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). *State Contracting & Eng’g Corp. v. Condotta America, Inc.*, 346 F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003) (where the general scope of a reference is outside the pertinent field of endeavor, the reference may be considered analogous art if subject matter disclosed therein is relevant to the particular problem with which the inventor is involved).

For the above reasons it is submitted that the claims as amended define patentable and allowable subject matter and the rejection of the claims as obvious over Li et al in view of Lindemann et al should be withdrawn.

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CONCLUSION

Based upon the foregoing, Applicants respectfully submit that the independent claims 1, 18, 25, and 44 particularly define and patentably distinguish the present invention over the cited reference. Accordingly, reconsideration of the rejection and allowance of claims 1-3, 6, 8, 18, 20-27, 29 and 31-44 are earnestly requested. However, should the Examiner have any remaining questions and the attending to of which would expedite such action, the Examiner is invited to contact the undersigned at the telephone number listed below.

No extension of time is believed to be required. However, the Commissioner is authorized to charge any fees associated with this or any other communication, or credit any over payment, to Deposit Account No. 09-0525.

Respectfully submitted,

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By: /Matthew M. Eslami/

Matthew M. Eslami

Reg. No. 45,488

Patent Agent for Applicant

International Paper Company

6285 Tri-Ridge Boulevard

Loveland, Ohio 45140

Tel: (513) 248-6193

Fax: (513) 248-6455

e-mail: matt.eslami@ipaper.com